EE/CprE/SE 492 BI-WEEKLY REPORT 1

1/13 - 1/29

Group number: 32

Project title: Development of a Smart Sensing System for Road Performance Data Collection

Client &/Advisor: PROSPER - Bo Yang & Halil Ceylan

Team Members/Role: Victor Guerra, Ethan Young, Michael Petersen, Shlok Singh

- o **Weekly Summary:**
  During the beginning part of the semester we worked hard on testing components to ensure that they worked. This began with testing the components individually and then together. Some of the components required soldering to get a secure connection for testing. We also got the International Road Index calculation started which comprised of converting an old Fortran algorithm to javascript. We are now beginning core development of the Arduino device, IRI calculation, and server.

- o **Past week accomplishments**
  - Testing of individual components
    - Arduino and modules was fully assembled. Testing was begun on each of the modules Individually. In further tests, GPS would not output coordinates. Solved by adding additional antenna to receive satellite fix.
  - Group test of the components
  - Soldered in the GSM shield to the header pins
    - GSM successfully tested to send text messages/calls and display network information.
  - Soldered accelerometer shield to wires
    - Accelerometer displays acceleration values and writes to SD card.
  - Converted the fortran IRI calculations to javascript
  - Compressed the required libraries for the shields.
    - When using all modules on the Arduino, the device does not have the memory for all required libraries. Unnecessary functions/features were removed to save space and leave room for future program code.
  - Enabled ports on the server to allow traffic in
  - Server Enabled

- o **Pending issues**
  - The IRI calculation needs to be debugged. Currently the calculation is outputting an incorrect answer.
  - Traffic not flowing in, currently trying different port combinations etc

o **Individual contributions**

Name	Individual Contributions	Hours this week	Total Hours
Victor Guerra	IRI Calculation, Arduino Testing	30	77
Ethan Young	IRI Calculation, Arduino Testing	30	81
Michael Petersen	Arduino Testing	25	72
Shlok Singh	Server Preparation/Development	25	72

Hours counted since end of previous semester

o **Plans for the upcoming week**

For the upcoming week we will work on fixing the IRI Javascript calculation as well as work on the code for the sampling rate. Further research/software development is needed to sample GPS data, and accelerometer values at the 120 data points/per second needed for IRI calculation. We will also test the backend cloud server to make sure that the Arduino can communicate with it.

o **Summary of weekly advisor meeting**

In our meeting with Bo, we went over how we will implement the IRI calculation and if the IRI calculation would be performed on the Arduino or the backend server. Because of the limitations of the memory and space on the Arduino, we will need to do the calculations on the backend server. Due to this, a documented Fortran IRI calculation would need to be converted to Javascript for server implementation. We also discussed what we accomplished over the break, where we are at, and upcoming tasks.